Technical Assistance — Madison County

Colonial Pipeline Booster Station
July 14, 2010

The Georgia Division of Public Health (GDPH) is responding to a concern that the C.O.P.S.'s organization has regarding the potential for a vapor intrusion exposure pathway that may affect residents living near the Colonial Pipeline Company's Booster Station located in Danielsville, GA. The Agency for Toxic Substances and Disease Registry (ATSDR) published a public health assessment written by GDPH regarding the Danielsville Booster Station (DBS) in June 2006. Based on all the available data evaluated by GDPH for this public health assessment, GDPH concluded that this site posed no apparent past or present public health risk to residents living near the Danielsville Booster Station. The potential for exposure to benzene, or any other volatile organic compounds through the vapor intrusion exposure pathway was not discussed in this public health assessment. GDPH determined that the potential for a vapor intrusion pathway did not exist. The basis of this determination is detailed below.

There are two basic criteria for determining if it is necessary to evaluate vapor intrusion at a hazardous waste site. First, volatile contaminants must be present in the subsurface. Second, buildings must be laterally and vertically close enough to the subsurface contaminants for concentrations above health concern levels to reach indoor breathing zones.

The DBS site only meets one of two basic criteria for determining if vapor intrusion may be a potential exposure pathway of concern. The benzene plume in the shallow saprolite aquifer is confined to the booster station yard, and the concentrations and plume size have remained relatively constant from 1995 to 2009. However, there is a trend of decreasing benzene concentrations in some of the saprolite monitoring wells within the confines of the DBS yard. Furthermore, the nearest residence with a home built on a slab is approximately 600 feet away from the edge of the shallow aquifer benzene plume (MW-12). Therefore, GDPH concludes that nearby residential exposure to benzene from the vapor intrusion pathway is highly unlikely.

Based on known parameters regarding the contaminated, shallow aquifer plume within the confines of the DBS boundaries, GDPH applied the EPA spreadsheet version of the Johnson and Ettinger (J&E) model to estimate benzene concentrations of indoor air assuming a slab-on-grade home were built directly over the edge of the plume over MW-12. A five-year average benzene concentration of 27.24 ug/L in MW-12 [3], 43 feet ±10 feet monitoring well depth [4], and an average soil (sandy loam) temperature of 66.27 º F were used as parameters in the J&E model's calculation of predicted indoor air concentrations in this hypothetical home.

Predicted results ranged from a low indoor air concentration of 0.3925 micrograms per cubic meter (ug/m^3) to a high indoor air concentration of 0.7893 ug/m^3. The low prediction concentration assumes a high moisture concentration in the soil and the deepest depth to contamination. The high prediction concentration assumes a low moisture concentration in the soil and the shallowest depth to contamination. The best estimate for predicted indoor air concentration is 0.6395 ug/m^3, which is based on the best estimate of depth to the sample location and residual moisture content for a sandy-loam soil. The best estimate is approximately 16 times below the ATSDR chronic minimum risk level (MRL) of 10 ug/m^3.

Based on a worst-case scenario where a slab-home is built directly over the boundary of the shallow aquifer, persons living inside that home would unlikely be impacted from benzene exposure through vapor intrusion.

Contaminants currently present in the deep bedrock aquifer plume (all bedrock wells are drilled at depths much greater than 100 feet) near the DBS have no bearing on the potential for human exposure through the vapor intrusion pathway.